

# IDL SIGNAL PROCESSING LIBRARY 1.0

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This document serves as an introduction to the small set of routines which extend IDL's signal processing capabilities that we are making available. The primary focus of these routines are David Thomson's multitaper methods which are described in detail in [1]. Here we will simply provide an introduction to the routines that come with this package with pointers on how to set them up on local filesystems and where to find further documentation. We expect that there will be a number of revisions and extensions to this library in the future which we are happy to support. Email correspondence should be directed to B. Pesaran at the above address. Please let us know of anything that needs fixing or is unclear to the user. Our goal is for these routines to be useable "stand alone".

The collection of files are all IDL procedures, some of them stand-alone, others interface with routines inside IDL or readily compiled C-routines from the LAPACK library of routines. The IDL procedures are documented in a primitive way by accessing the `idl_help.html` document in this directory using any standard Web browser such as Netscape. There is usually an "open file" button on your browser into which you type the path of the html file.

To make the use of the library easy, it is best to place the `.pro` programs in a single directory which you add to the `$IDL_PATH` variable. This allows IDL to access them directly without the user compiling them in advance. For the purposes of this document, we will assume that the files reside in a directory `idl_lib` in your home space, `/idl_lib`. In addition the compiled executable, `idl.*.so`, must be kept available to IDL. This library is too large to be stored on the LANL site and must be downloaded by anonymous ftp from `charybdis.caltech.edu` where various versions of it reside in `/pub/idl/lib/lapack_idl.*.so`. We will assume that this library has been placed in the `lib` directory in your home space, `/lib`. This directory should then be added to your `$LD_LIBRARY_PATH` variable. There are a number of points at which the `$IDL_PATH` and `$LD_LIBRARY_PATH` variables can be set. If you are using a `tcsh` or `csh` then just add the lines to your `.tcshrc` or `.cshrc` file:

```
setenv IDL_PATH ~/idl_lib:$IDL_PATH
setenv LD_LIBRARY_PATH /lib:$LD_LIBRARY_PATH
```

If you are using a different shell, you can add the equivalent statements to the `.profile` file.

The use of the compiled executables is an important extension to IDL. This provides access to the complete Lapack library from IDL. All that is needed is a wrapper function that calls a specific routine inside a dynamic link library. The dynamic link library is called `lapack_idl.*.so` and has been compiled for Sun OS 4.3 and Linux. Other platforms will be supported in the future.

Once these changes have been made, you should have full access to the routines.

Have fun!

## References

- [1] P. P. Mitra and B. Pesaran. The analysis of dynamic brain images. *Biophysical Journal*, Submitted.